

Colorado Department of Health

Review and Comment

Final Phase I RFI/RI Workplan for OU 5, the Woman Creek  
Priority Drainage, August, 1991

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General Comments:

1) Based on language within IAG sections VI and VII, the Division does not agree with DOE's assumption that there will be a Phase II RFI/RI investigation in OU 5. The IAG Statement of Work, Section VII.A states that:

"The Phase I RFI/RI Report . . shall include . . data documenting the location and characteristics of surface and subsurface features and contamination at each site within each OU including the affected media, location of contaminants, types of contaminants, physical state of contaminants, concentration and quantity of contaminants. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout each source and the extent of contaminant migration through each of the affected media shall be documented."

The Division interprets this to mean that a Phase I investigation needs to be as comprehensive and complete as possible so that the nature, extent, fate, and transport of contamination at a site can be determined. Phase II investigations would only become necessary if unexpected problems arose or inadvertently overlooked data needs become evident later.

The Division believes that this workplan has been crippled by the assumption that a Phase II investigation will follow. The collection of indispensable information has been delayed to Phase II unnecessarily making it impossible for the Phase I investigation to meet the IAG requirements. Until this is resolved, the State can not recommend approval this plan.

Specific Comments:

Executive Summary: A fifth bullet needs to be added to the list presented on page ES-2. This bullet could say "Determine contaminant fate and transport." As is stated in section VII of

the IAG, a description of the fate and transport of constituents within this OU is a requirement of Phase I RFI/RI Reports.

Section 2.1: In the first paragraph on page 2-8, please add an explanation of what is currently being done to the discharges from ponds C-2, B-5, and A-4. The text discusses some past practices, but does not discuss the current diversion and routing system for these ponds.

Table 2-2 and 2-3: It is not clear from these tables whether or not additional analytes and analyte groups were found or tested for in the subject wells. For instance, no volatiles are listed on either table. Does this mean that they were tested for, but were not found, or were volatiles not tested for? Please either expand the text or clarify the tables.

Section 2.6: The Division's comments to the draft version of this document asked that the conceptual model be expanded to address several shortcomings. DOE's response was to make the model even more brief and less adequate. A conceptual model is essential in assuring that adequate data (both in terms of types and numbers of samples) are collected to fully support a Baseline Risk Assessment. It is inappropriate to delineate "primary" and "secondary" pathways at this point because there is not enough data to definitively rule out or rank the different pathways. Therefore, all of the pathways, no matter how seemingly insignificant, must be considered, and either samples need to be included in the FSP that can quantify the risk from each pathway, or sufficient understanding of a pathway must be obtained to model the risk to receptors. In light of this, the Division expects the following to appear in an approvable version of the conceptual model:

- 1) A flow chart or diagram presenting each historical source, current source, release mechanism, transport medium, secondary release mechanism, exposure route and receptor for each major contaminant source-type in each IHSS (ie. contaminated surface soils, buried waste or subsurface contamination, surface water, etc). This diagram would include each of the above listed items in boxes that are connected by arrows showing the different combinations that constitute complete pathways.
- 2) A table or matrix summarizing the same information presented in 1) above with each pathway being a separate line item.
- 3) As part of 2) above, to be presented in section 7 (FSP), an IHSS by IHSS breakdown of what sampling is being done to quantify each pathway. Supporting discussion should be included that justifies DOE's determination that the sampling and analysis program is adequate.

Very good examples of 1) and 2) can be found in Section 2 of the

Draft Phase I RFI/RI Workplan for OU 3, the Off-site Areas. An equivalent treatment of the conceptual model in this document would be sufficient for approval.

Section 3.0: The Division will withhold any additional comments to this section until such time as a site-wide approach to ARARs has been discussed between DOE and the regulatory agencies. Therefore, the State is reserving the right to comment on this section at a later date even though this is a "final" document.

Section 4.1.3: This section is completely incorrect. As stated previously, a conceptual model **must** be developed during workplan design that delineates potential pathways. To be able to decide which pathways are actually contributing to receptor risk, data for all pathways must be collected. By stating here that DOE will wait until after the data comes in to decide which pathways need to be analyzed is to put the cart before the horse.

Section 4.2.4: As an example of what the Division still considers to be a major problem with this document (as stated in the General Comments), the statements in this section are, we feel, in error. This problem is still pervasive throughout the document. As we have stated, to assume that there will be a Phase II is inappropriate.

Section 7.0: Consideration needs to be given to the southern areas of the buffer zone, particularly surface soil contamination north of the southern RFP property boundary. The local municipalities are very concerned about the adequacy of current data in this area. They are also concerned that the OU 3 RFI/RI will not sample any remote areas that are on-site. Text recognizing that OU 5 covers the buffer zone all the way to the southern property boundary and that past sampling programs have sufficiently characterized this area may be sufficient. However, it is necessary to address this portion of the plant buffer zone in some manner.

Section 7.2.1: In "Step 2", the Division again states that we do not believe that placement of the soil gas probes to a depth of 2 feet is sufficient. At that depth, probe isolation from the surface is not guaranteed and atmospheric crossflow from the surface is a possibility. The Division would like to see the probes driven to at least 3 feet, and 5 feet would be better. In addition, based upon the new figures that appear in the text regarding the landfill (area = 330,000 sq ft, volume = 2,000,000 cu ft), the average thickness of the landfill is 6.1 feet. The Division does not think that a 100 foot grid spacing is capable of picking up plumes and/or sources in a 6 foot thick unit. In our opinion, a comprehensive soil gas survey at the Old Landfill would have a grid spacing of not more than 25 feet. For this portion of the workplan to be approvable, some technical justification of the 100 ft grid spacing will be required.

"Step 3" explains that six soil borings will be drilled in the disturbed area east of the landfill, but only two will be drilled within the landfill. The Division does not understand why this is so. Is there reason to believe that the disturbed area is safer to penetrate with a boring? If so, why? If not, why not drill more borings within the landfill so that a three dimensional characterization can occur. The disturbed area is getting a fairly complete characterization, but the landfill is still lacking, particularly in the three-dimensional characterization.

"Step 3" also describes the soil cores. The text implies that the analysis of the soil will be for soil at the same depth that the soil gas sample was taken. The Division agrees that this is a logical place to take the sample. We are still curious, though, whether the surface soil materials will be sampled at these locales or just the subsurface materials.

The previous comment was prompted by the fact that no surface soil samples are being planned for the landfill. When a pathway analysis is performed, as mentioned previously, it will show that several pathways (soil ingestion, dermal contact with soil, wind blown soil inhalation, ingestion of wind blown dust resettled dust on plants, biota tracking, and infiltration into the subsurface) can be sampled for by simply adding soil samples to the plan with analysis for rads and metals. This must be added to the plan before the Division can recommend approval.

"Step 4" concerns the placement and drilling of the four monitoring wells down gradient of the landfill. After a close analysis of Figures 2-4 and 2-5, it is clear that the thickness of the saturated alluvium in the vicinity of the landfill is very thin and may well be zero for long periods of time, a situation similar to the 881 Hillside. With this in mind, the Division is very concerned that 1) the four monitoring wells may never collect any water or very small and periodic amounts and 2) because of this, any subsurface contaminant within the landfill could remain undetected, even if it leaves the site in a free-product or dissolved state. We believe that the average thickness of fill in the landfill could not allow much lateral dispersion to occur and would result in very narrow plumes. For these reasons, we do not think the present monitoring well plan is sufficient. We would recommend that either more downgradient wells be drilled or some sort of a vadose zone monitoring system be placed in and around the landfill so that contaminants leaving the site could be detected. In addition, the plan calls for a monitoring well to be drilled within each verified plume. This well may suffer from the same lack of saturated alluvium that the downgradient wells may encounter and may be useless as a continued source of information. The Division recommends that the wells be completed as both saturated zone and unsaturated zone monitoring wells.

Section 7.2.2: In "Step 2", the text states that the sodium iodide

sensors will be placed so that overlapping coverage between stations will "essentially" provide 100% coverage for the radiation survey. Please design the station placement grid so that 100% coverage can be assured.

There is an inconsistency between Table 7-2 and Table 7-7. Table 7-7 lists surface samples on 25' centers as one of the sample types to be collected. Table 7-2 does not mention this. In turn, Table 7-2 mentions soil samples that will be taken over radiation hot-spots defined by the rad survey. Table 7-7 does not mention this. Please resolve these discrepancies. For the same pathway reasons mentioned above, surface soil samples must be taken in the Ash Pits and analyzed for rads and metals.

In "Step 4" of this section, the monitoring wells will probably suffer from the same saturated alluvium problem that the landfill has. Thought needs to be given as to how DOE plans to address this problem at the ash pits.

Section 7.2.4: There seems to be some inconsistent sampling of the different sub-sites within IHSS 209. For instance, in the surface disturbance south of the ash pits, some of the former excavation sites are being sampled by soil borings. One excavation, however, is only having the surface soil sampled. Within IHSS 209 proper, no soil borings are planned and only surface soil samples are to be taken. The Division would like for the sampling program to be more consistent. We feel that present knowledge of these sites is very limited and that soil borings and surface soil samples are necessary to characterize these two sites. This would leave surface soil sampling only at the surface disturbance west of IHSS 209. Again, these changes are important because of the pathways that must be sampled for in the Risk Assessment.

Table 7-7: Please refer to the copy of Table 7-7 attached to these comments which included the changes proposed by the Division.

These changes are recommended for the following reasons:

IHSS 155: 1) Because of the unknown nature of possible contaminants in the landfill, water from the effluent pipes and any monitoring wells in the landfill should get a comprehensive analysis including Cr, Nitrate, and Gross alpha and beta.

2) Surface soils must be collected and analyzed at the landfill. Analysis should be the same as for the surface disturbance soils.

IHSS 133: 1) Surface soils and soil borings must be analyzed for Pu and Am even though these are not thought to have been placed in the Ash Pits. In the same way the surface disturbance soils are, these samples must be analyzed for vols and semi-vols.

2) Water from the monitoring wells should be evaluated for Cr and Gross alpha and beta for reasons similar to the ones presented above for the landfill wells.

IHSS 209: 1) All of the media being collected in the surface disturbances should be analyzed for Pu and Am. This should be done so that the data can dovetail into the analyses being done in the various media in OU 3 and for the Risk Assessment.

In Summary: In order for the State to be able to recommend approval for this workplan, the following items must be addressed:

1) The conceptual model must be expanded to address the items listed previously in these comments.

2) The FSP must include surface soil sampling (analyzed at least for all rads and TAL metals) in the Old Landfill and the Ash Pits.

3) Because the saturated alluvium in the vicinity of the Old Landfill and the Ash Pits may be very thin or not present, the monitoring well strategy must be re-thought. Approvable plans could include more wells, vadose zone monitoring, or some combination of both. In addition, since saturated conditions may only occur in the bedrock, some sort of bedrock characterization or monitoring will be necessary.

4) A more comprehensive characterization of radionuclides, metals, and semi-volatiles in the subsurface of the landfill is required. In other words, an understanding of the three-dimensional distribution of all types of contaminants in the landfill must be a goal of this RFI/RI. This is required by the IAG in Section VII. This could be done by several methods, the choice of which is up to DOE.

5) The grid spacing for the soil gas survey in the Old Landfill must be a figure that can be technically supported by DOE.

6) The analysis program listed on Table 7-7 must either be changed or demonstrated to analyze for each possible pathway. It must also be demonstrated to be internally consistent.

7) The sampling at the surface disturbances must include both surface soils and soil borings except for the surface disturbance west of IHSS 209.

8) The southern areas of the buffer zone, adjacent to the plant property boundary need to be addressed in some manner.

9) The structure of this plan needs to be modified to correctly address the scope of a Phase I RFI/RI investigation and the limited scope of a Phase II RFI/RI investigation.